
Meridian 1 power plants

Meridian 1 has several DC power plant options:

- MFA150 Modular Power Plant
- MPP600 Modular Power Plant (replaced by System 600/48 Power Plant)
- System 600/48 Power Plant
- J2412 Power System
- NT6D82 Power System

These power systems are called “DC” because they deliver DC to the pedestal of the Meridian 1 system. AC-powered systems accept AC at the pedestal and distribute AC to the power supplies located in each module.

This section discusses the function and installation considerations of these four DC power systems. A discussion of uninterruptible power supplies (UPS) and reserve power using batteries is also provided.

The terms “AC system” and “DC system” refer to the type of power brought into the pedestal and distributed within the system to the module power supplies. Figure 1 on page 7 and Figure 3 on page 9 show the basic power distribution for AC and DC systems. All system options (except option 21A) are available in both AC power and DC power versions. Option 21A is available with AC power only.

MFA150 Modular Power System

The MFA150 is a modular, front access power system with a –48 V dc output and a capacity of 150 A, provided in 25 A increments by MPR25 plug-in rectifier modules. The MPR25 Modular Power Rectifier and MPS75 Modular Power Shelf are the main system components (see [Figure 16](#)).

The MFA150 can be used with all Meridian 1 DC-powered systems as a replacement for NT6D52 rectifiers, NT0R72 rectifiers, in combination with a QBL15 Power Distribution Box. However, in large systems such as system options 71, 81, and 81C, the MFA150 should be used only if the system configuration does not require more than 150 A. Other switchroom equipment that requires –48 V dc power may also be powered from the MFA150 as long as there are sufficient output circuit breakers or auxiliary fuses, the total load does not exceed 150 A, and a consistent single-point ground topology is maintained for all associated equipment.

Two configurations of the MFA150 are available for Meridian 1 systems:

- The NT5C90EF has a single MPS75 shelf with a capacity of 75 A.
- The NT5C90EG is a dual-shelf configuration with a capacity of 150 A.

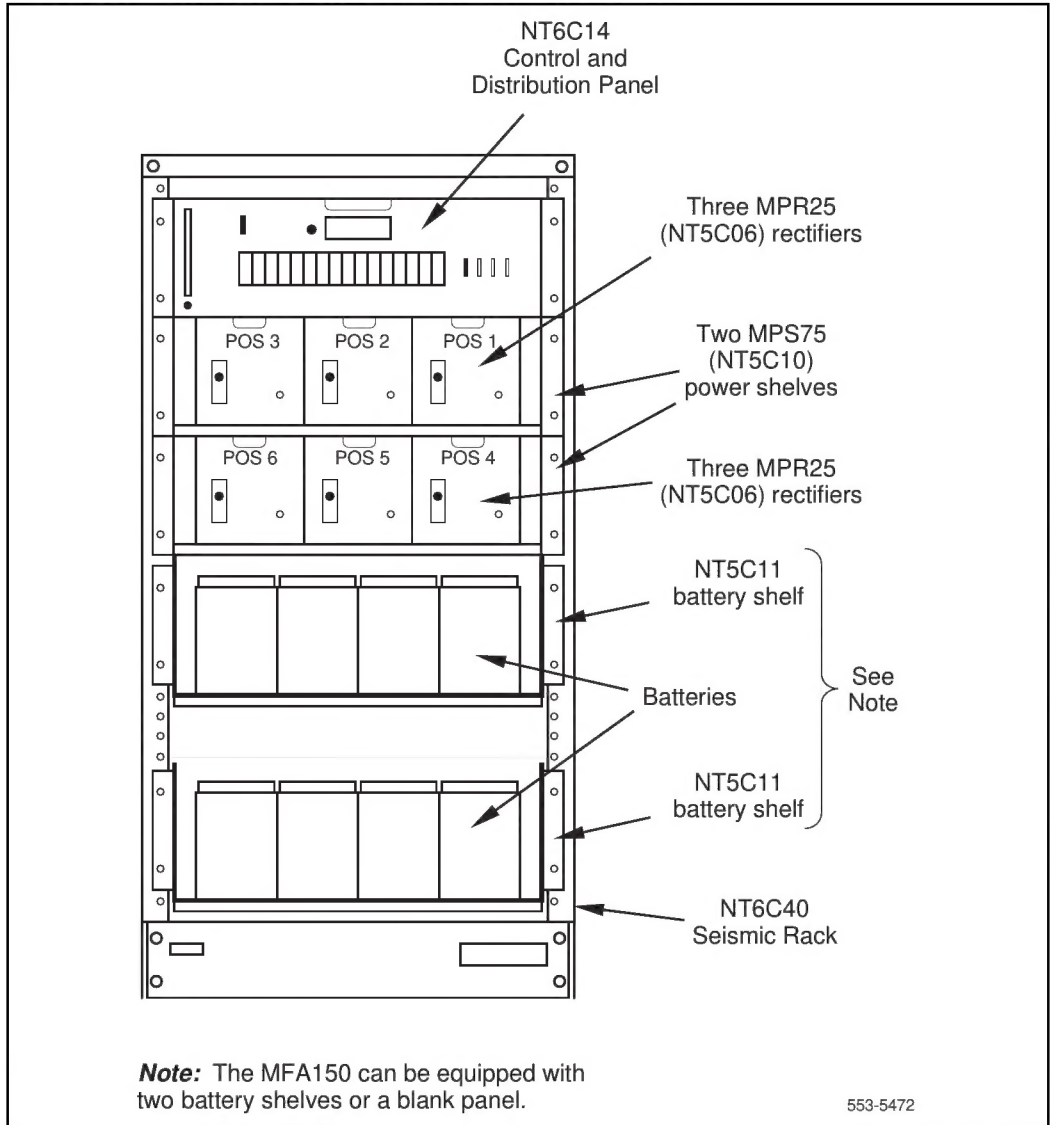
Note: Both configurations are seismic zone 4 approved.

Each of these configurations is a complete power bay, with an NT6C14 Control and Distribution Panel mounted on an NT6C40 Seismic Rack as shown in [Figure 16](#). A power bay is a relay rack for power equipment and contains the power distribution and control circuitry.

The MPR25 is a switched mode rectifier that operates on single-phase, 50/60 Hz, AC service on either 208 or 240 V nominal input. The power system can operate with or without a –48 V dc battery bank for reserve power capabilities. If batteries are connected, the rectifiers can operate in either the float or equalize mode.

The system has a variety of monitoring and alarm features, such as high and low voltage alarms, fuse and breaker alarms, rectifier failure alarms. An interface to the NT8D22 System Monitor provides a subset of these alarms.

Figure 16
MFA150 Modular Power System with six MPR25 rectifiers



The MFA150 also provides built-in AC power conditioning and surge protection, and digital voltage and current meters for monitoring of overall system and individual rectifier status. A low-voltage disconnect (LVD) battery protection feature disconnects the batteries prior to complete exhaustion, and automatically reconnects them after AC power is restored. Two optional internal battery trays help to reduce floor space requirements.

One MFA150 is required for each DC-powered system. Depending on the system power consumption, up to two MPS75 shelves and six MPR25 rectifiers may be equipped.

Specifications

Selected specifications used for system engineering and site planning are listed in [Table 10](#).

Table 10
MFA150 specifications (Part 1 of 2)

Specification	Characteristic	Min	Nominal	Max
Input voltage	Voltage (V ac)	176	208–240	264
	Frequency (Hz)	47	50–60	63
	AC input wiring requires one 50 A, hard-wired, AC circuit per shelf which will accommodate three MPR25 rectifiers.			
Output voltage	Float (V dc)	46	54.0*	56
	Equalize (V dc)	50	55.5	65
	* Factory set output float voltage is 54 V dc, to accommodate a standard 24-cell battery string of 2.25 V per cell (typical VRLA batteries). System output current is 25 A with one MPR25 rectifier, to a maximum of 150 A with six MPR25 rectifiers.			
Noise specifications	Wideband noise:	<100 mV rms (<5 mV, typical)		
	(10 kHz –20 MHz)	<250 mV peak-peak(<175 mV, typical)		
	Voiceband noise	<22 dBrnC (<15 dBrnC, typical)		
Note: Measured at output, with or without batteries under worst-case conditions. These specifications are maintained under all operating conditions, including surge conditions previously described.				

Table 10
MFA150 specifications (Part 2 of 2)

Specification	Characteristic	Min	Nominal	Max
Mechanical specifications	Overall dimensions of the NT6C40 Seismic Rack: H=127.0 cm (48 in.) W=61.9 cm (24.38 in.) D=38.1 cm (15 in.)			
	Weights:			
	MPR25 Rectifier	6.7 kg (14 lb)		
	MPS75 Shelf	10.5 kg (23 lb)		
	NT6C14GB Control Panel	24.5 kg (54 lb)		
	NT6C40 Seismic Rack	15 kg (33 lb)		
	System configurations	Weight empty (without rectifiers)		Weight full
	NT5C90EF, single-shelf	50 kg (110 lb)		69.1 kg (152 lb)
	NT5C90EG, dual-shelf	60.5 kg (133 lb)		98.6 kg (217 lb)
	Floor loading (no batteries) 489 kg/m ² (100 lb/ft ²)			
Miscellaneous	Heat dissipation	150 W, or 512 BTU per hour, per rectifier		
Standards compliance	Standard: ANSI Std C62.41/IEEE Std 587-1980, Class A and B lightning surge			
	Specification: 6000 V, 3000 A, 1.2 x 50 μs impulse, 10 hits per second			
	Standard: ANSI Std C62.41 oscillatory surge			
	Specification: 2500 V, 0.5 μs impulse, 100 kHz positive/negative oscillating decay			
	Standard: Bellcore TR-TSY-000947			
	Mean time between failures (MTBF) of each rectifier	>120,000 hours, per Bellcore standards		

MPP600 Modular Power Plant

Note: The MPP600 Power Plant has been replaced by the System 600/48 Power Plant for all new installations.

The MPP600 Power Plant is a positive ground, -48 V dc, 600-A power plant. It can be used with all Meridian 1 DC-powered systems, but is optimized for larger system configurations such as system options 71, 81, and 81C. Other switchroom equipment that requires -48 V dc power may also be powered from the MPP600, as long as there are sufficient output circuit breakers or auxiliary fuses, the total load does not exceed 600 A, and a consistent, single-point ground topology is maintained for all associated equipment.

The MPP600 consists of either one main cabinet (for loads requiring up to 300 A) or one main and one supplemental cabinet (for loads up to 600 A), a common equipment panel, distribution and control panels, and rectifier shelves. The MPP600 utilizes up to twelve 50-A switch mode rectifiers (MPR50) as building blocks connected in parallel to reach the maximum capacity of 600 A. This maximum capacity may be attained without power interruption to the load.

The rectifiers operate on single-phase 50 or 60 hertz AC service from either 208 V or 240 V nominal input. The power system may operate with or without -48 V dc batteries for reserve power. If batteries are connected, the rectifiers can operate in either the float or equalize mode.

The MPP600 is designed with access from the front and the rear; all operational controls are accessible from the front of the unit. It is designed for seismic environments to Zone 4 (Bellcore) free standing configurations, with no external bracing required.

The MPP600 has a variety of monitoring and alarm features, such as high and low voltage alarms, fuse and breaker alarms, rectifier failure alarms, and low voltage disconnect. An interface to the NT8D22 System Monitor provides a subset of these alarms.

Specifications

Selected specifications used for system engineering and site planning are listed in [Table 11](#).

Table 11
MPP600 specifications (Part 1 of 3)

Specification	Characteristic	Min	Nominal	Max
Input voltage	Voltage (V ac)	176	208 or 240	264
	Frequency (Hz)	47	50 or 60	63
	AC input wiring requires one 25 or 30 A hard-wired AC circuit per MPR50 rectifier.			
Output voltage	Float (V dc)	46	54.0*	56
	Equalize (V dc)	50	55.5	65
	Note: Factory set output float voltage is 54 V dc, to accommodate a standard 24-cell battery string of 2.25 volts per cell (typical VRLA batteries). Note: System output current is 50 A per MPR50 rectifier, to a maximum of 600 A with 12 MPR50 rectifiers in 2 cabinets.			
Noise specifications	Wideband noise:	<100 mV rms	(typical is <5 mV)	
	(10 kHz –20 MHz)	<250 mV peak-peak	(typical is <175 mV)	
	Voiceband noise	<22 dBrnC	(typical is <15 dBrnC)	
Note: Measured at output, with or without batteries under worst-case conditions. These specifications are maintained under all operating conditions, including surge conditions previously described.				

Table 11
MPP600 specifications (Part 2 of 3)

Specification	Characteristic	Min	Nominal	Max
Mechanical specifications	MMP600 main or supplemental cabinet:	H=182.9 cm (72 in.) W=72.4 cm (28.5 in.) D=72.4 cm (28.5 in.)		
	Weights			
	MPR50 Rectifier (NT5C07)	9 kg (19.8 lb)		
	CE Panel (NT6C31AB)	16 kg (35 lb)		
	Control and distribution panel	18 kg (40 lb)		
	Distribution panel	18 kg (40 lb)		
	Rectifier shelf	13.6 kg (30 lb)		
	Empty cabinet	152.3 kg (355 lb)		
	Full cabinet	221.4 kg (487 lb)		
	Floor loading, fully loaded (no batteries):	451.8 kg/m ² (92.85 lb/ft ²)		
Point loading, fully loaded (no batteries):	451.8 kg/m ² (92.85 lb/ft ²)			
Miscellaneous specifications	Heat dissipation	380 watts, or 1300 BTU per hour, per rectifier		
	Mean time between failures (MTBF) of each rectifier	>120,000 hours, per Bellcore standards		

Table 11
MPP600 specifications (Part 3 of 3)

Specification	Characteristic	Min	Nominal	Max
Standards compliance	Standard: ANSI Std C62.41/IEEE standard 587-1980, Class A and B lightning surge Specification: 6000 volts, 3000 amps, 1.2 x 50 μ s impulse, 10 hits per second			
	Standard: ANSI Std C62.41 oscillatory surge Specification: 2500 volts, 0.5 μ s impulse, 100 kHz positive/negative oscillating decay			
	Standard: Bellcore Std TR-TSY-000947			
	Standard: UL Std 1801			
	Standard: UL Std 1950			
	Standard: CSA Std 22.2 #234 and #225			
	FCC Rules and Regulations, Part 15, Subpart B for class A equipment			
	Standard: CSA Std 108.8 for class A equipment			
	Standard: UL Std 1459 Ed. 2			
	Standard: IEC-950 Std, VDE EN 60950/EN41003 (applies to MPR50 rectifier only)			

System 600/48

The System 600/48 Power Plant is described in detail in *Meridian 1 applications - System 600/48* (167-9021-111).

The System 600/48 Power Plant is a positive ground, -48 V dc, 600-A power plant. It can be used with all Meridian 1 DC-powered systems, but is optimized for larger system configurations such as system options 61C and 81C. Other switchroom equipment that requires -48 V dc power may also be powered from the System 600/48 Power Plant, as long as there are sufficient output circuit breakers or auxiliary fuses, the total load does not exceed 600 A, and a consistent, single-point ground topology is maintained for all associated equipment.

The System 600/48 Power Plant consists of either the NT6C32AD main bay (for loads requiring up to 300 A) or the NT6C32AD main bay and the NT6C32AE supplemental bay (for loads up to 600 A), a front access common equipment panel, one front access controller, one front access circuit breaker panel, and two rectifier shelves that can contain up to six NT5CO7AC rectifiers. Included with the supplemental bay are all DC cables and signal wires to connect the supplemental bay to the main bay. The two bays should be within 20 cable feet from each other.

The System 600/48 Power Plant utilizes up to twelve 50-A switch mode rectifiers (NT5CO7AC) as building blocks connected in parallel to reach the maximum capacity of 600 A. This maximum capacity may be attained without power interruption to the load.

The rectifiers operate on single-phase 50 or 60 hertz AC service from either 208 V or 240 V nominal input. The power system may operate with or without -48 V dc batteries for reserve power. If batteries are connected, the rectifiers can operate in either the float or equalize mode.

The System 600/48 Power Plant is designed with access from the front. All operational controls are accessible from the front of the unit. It is designed for seismic environments to Zone 4 (Bellcore) free standing configurations, with no external bracing required.

The System 600/48 Power Plant has a variety of monitoring and alarm features, such as high and low voltage alarms, fuse and breaker alarms, rectifier failure alarms, and low voltage disconnect. An interface to the NT8D22 System Monitor provides a subset of these alarms.

Equipment applications

System 600/48 Power Plant is designed to power Meridian 1 DC systems that require less than 600A of current capacity. Many existing SL-1 cabinet types are also supported.

WARNING

System 600/48 Power Plant and the NT5C07AC 50A rectifiers are not compatible with the earlier SL-1 and Meridian 1 power rectifiers, such as the NT6D52, QRF 12, QRF8, QRF9, or NT6D82.

Power systems containing these rectifiers cannot be connected in parallel nor attached to the same battery string with the NT5C07AC rectifiers from the System 600/48 Power Plant.

System 600/48 Power Plant is intended for new applications and for upgrade situations where the System 600/48 Power Plant is used to power both the existing and the new communication equipment.

System 600/48 Power Plant may power any equipment that requires -48V power as long as the total current requirement does not exceed 600A and a consistent single point ground topology is maintained for all associated equipment. It is recommended that the auxiliary equipment whose logic and frame grounds are separated be connected to the Meridian 1 and the System 600/48 Power Plant. General grounding information can be found this document and in the following documents:

- *Meridian 1 installation planning (553-3001-120)*
- *Meridian 1 system installation procedures (553-3001-210)*

Note: The System 600/48 Power Plant 's NT6C32AE supplemental bay can be used to upgrade the existing MPP600 and QCA13 power systems. To upgrade the MPP600 Power Plant an LVD kit (P0816320) is required. To expand the QPA13 a kit is not required.

Specifications

Selected specifications used for system engineering and site planning are listed in [Table 12](#).

Table 12
System 600/48 specifications (Part 1 of 3)

Specification	Characteristic	Min	Nominal	Max
Input voltage	Voltage (V ac)	176	208 or 240	264
	Frequency (Hz)	47	50 or 60	63
	AC input wiring requires one 25 or 30 A hard-wired AC circuit per NT5C07 rectifier.			
Input Current	Current (A) at input voltage of 208 VAC and -56 VDC for 50A output current.		15	
Input AC Service Recommendation	A 30A two pole circuit breaker for each rectifier at the AC service panel. If two individual circuit breakers are used side-by-side, they should also be rated at 30A and 250V. Refer to <i>Meridian 1 installation planning</i> (553-3001-120) for the AC service panel requirements.			
Input protection	A two pole circuit breaker for each rectifier input to break both input lines for 208/240 VAC, 20A service.			
Output voltage	Float (V dc)	46	54.0*	59.5
	Equalize (V dc)	50	55.5	63.5
	Note: Factory set output float voltage is 54 V dc, to accommodate a standard 24-cell battery string of 2.25 volts per cell (typical VRLA batteries).			
Output current rating	System output current is 50 A per NT5C07 rectifier, to a maximum of 600 A with 12 NT5C07 rectifiers in 2 bays.			
Output protection	The output current limiting circuit is set in the factory to limit the output to 52.5A. A single pole 60A circuit breaker is connected in series with the negative output terminal in the rectifier			
Output regulation	Within +/- 0.5% of the set output value for all specified input and output variations. Within +/- 1% including the environmental variations.			
Heat dissipation	4,560 Watts (15,579 Btu/hr) for a fully equipped System 600/48.			

Table 12
System 600/48 specifications (Part 2 of 3)

Specification	Characteristic	Min	Nominal	Max
Mechanical specifications	System 600/48 Power Plant main or supplemental cabinet:	H=1473 mm (58 in.), 1549 mm (61 in) with top hat extension W=610 mm (24 in.) D=381 mm (15 in.)		
Total weight without rectifiers	Main bay: 350 lb (159 kg) Supplemental bay: 260 lb (118 kg)			
Total weight with rectifiers	Main bay: 482lb (219 kg) Supplemental bay: 392 lb (179 kg)			
	CE Panel (NT6C18CB)	18 kg (40 lb)		
	Front access circuit breaker panel (NT6C12FB)	11.3 kg (25 lb)		
	Front access controller (NT6C25FX)	7.5 kg (16.5 lb)		
	Rectifier shelf	15 kg (33 lb)		
	50A Switch Mode Rectifier (NT6C07AC)	10 kg (22 lb)		
	Floor loading, 3.1 N/sq m (64.3 lb/sq in) for the main bay and 2.5 N/sq m (52.2 lb/sq in) for the supplemental bay.			
	Point loading, 18.8 N/sq cm (27.2 lb/sq in) for the main bay and 15.3 N/sq cm (22.1 lb/sq in) for the supplemental bay.			
Miscellaneous specifications	Heat dissipation	380 watts, or 1300 BTU per hour, per rectifier		

Table 12
System 600/48 specifications (Part 3 of 3)

Specification	Characteristic	Min	Nominal	Max
Standards compliance	Standard: ANSI Std C62.41/IEEE standard 587-1980, Class A and B lightning surge Specification: 6000 volts, 3000 amps, 1.2 x 50 μs impulse, 10 hits per second Standard: ANSI Std C62.41 oscillatory surge Specification: 2500 volts, 0.5 μs impulse, 100 kHz positive/negative oscillating decay Standard: Bellcore Std TR-TSY-000947 Standard: UL Std 1801 Standard: UL Std 1950 Standard: CSA Std 22.2 #234 and #225 FCC Rules and Regulations, Part 15, Subpart B for class A equipment Standard: CSA Std 108.8 for class A equipment Standard: UL Std 1459 Ed. 2 Standard: IEC-950 Std, VDE EN 60950/EN41003 (applies to NT6C07AC rectifier only)			

[Table 13](#) list the operating and storage temperature, humidity, and altitude. It also lists the storage temperature and humidity and transportation vibration and shock parameters.

Table 13
Environmental specifications

Parameter	Description
Operating temperature	0°C to 50°C (32°F to 122°F)
Operating humidity	0 to 95% (non-condensing)
Operating altitude	Sea level to 2100 m (7000 feet)
Transportation and storage temperature	–50°C to 75°C (–58°F to 167°F)
Transportation and storage humidity	0 to 95% (non-condensing) 4 kPa max. WVP for 10 days
Transportation vibration	TR-EOP-000063 Section 5.4.4 Transportation Vibration of the packaged equipment
Transportation shock	TR-EOP-000063 Section 5.4.1 Handling Drop Tests and TR-NWT-000063 Section 5.4.3 Installation Shop Tests

J2412 Power Plant

The J2412 Power Plant is a complete external power supply which can be used with system options 71, 81, and 81C (and large option 61 and 61C configurations). The power plant consists of the QCA13 main power cabinet which houses up to four rectifiers. Up to two supplemental cabinets can be added, with up to four rectifiers in the first supplemental cabinet and up to two rectifiers in the second cabinet, for a total of 10 rectifiers.

QCA13 cabinet

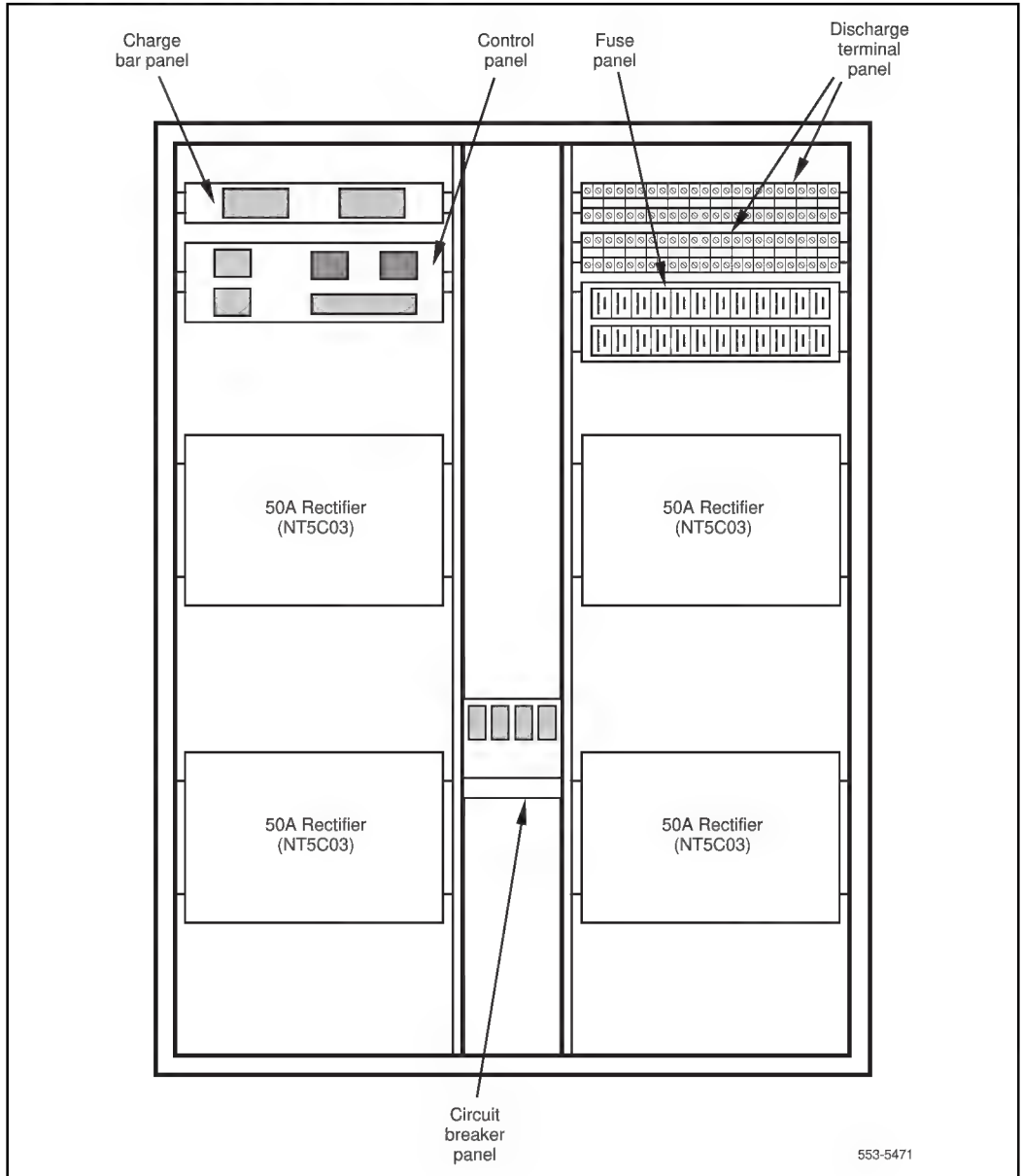
The QCA13 is the cabinet that houses fusing and distribution components, monitoring and control equipment, and up to four NT5C03 or NT5C07 rectifiers (see [Figure 17](#)). The NT5C07 Rectifier is superseding the NT5C03 Rectifiers in QCA13. When using NT5C07 Rectifiers in a QCA13 cabinet, an NT5C12 Modular Power Shelf must be used. Multiple cabinets can be added to house up to ten rectifiers. [Table 14](#) lists the specifications of the QCA13 cabinet.

Table 14
QCA13 specifications

Characteristic	Specification
Physical dimensions	H = 182.9 cm (72 in.) W = 129.5 cm (51 in.) D = 50.8 cm (20 in.)
Weight	590 kg (1300 lbs)
Floor loading	977 kg/m ² (200 lb/ft ²)
Floor bearing	342 kg/m ² (70 lb/ft ²)
Power dissipation	1400 watts

Note: QCA13 is the designation for an empty cabinet, but the total package (the cabinet, the NT5C03 or NT5C07 rectifier, and other equipment housed in the cabinet) is commonly referred to as QCA13. The supplemental cabinets are identical to the main cabinet except that they do not contain the control panel and charge bar panel.

Figure 17
QCA13 Main Power Cabinet Assembly



NT5C03 rectifier

The NT5C03 is a switch mode rectifier that converts 208/240 V ac to –48 V dc with a 50 A output. Up to ten rectifiers can be used in parallel for a total system capacity of 500 A. The quantity required is determined by system power consumption. [Table 15](#) contains specifications for the NT5C03.

When wiring the QCA13 cabinets to the commercial utility AC power, you must provide one direct-wired 30 A circuit per rectifier. This circuit consists of #10 AWG conductors connecting to terminals L1 (AC hot conductor), L2 (AC neutral conductor), and FR GND (AC ground) on each rectifier.

NT5C07 rectifier

The NT5C07 is a switch mode rectifier that converts 208/240 V ac to –56 V dc with a 50 A output. Up to ten rectifiers can be used in parallel for a total system capacity of 500 A. The quantity required is determined by system power consumption. [Table 10](#) contains specifications for the NT5C07.

When wiring the QCA13 cabinets to the commercial utility AC power, you must provide one direct-wired 30 A circuit per rectifier. This circuit consists of #10 AWG conductors connecting to terminals L1 (AC hot conductor), L2 (AC neutral conductor), and FR GND (AC ground) on each rectifier.

QBL12 distribution box

The QBL12 Power Distribution Box is a wall-mounted unit that connects customer-provided power equipment to the Meridian 1. A QBL12 can provide up to twenty-four 30 A feeds; the number of feeds actually used will depend upon system configuration and distance from the QBL12 to the Meridian 1. The total allowable load current is 600 A. Generally, one power distribution box is required per system (see Figure 18 on page 73). The QBL12 can be used with system options 71, 81, 81C and large option 61 and 61C configurations.

The QBL12 measures 66 cm (26 in.) high, 61 cm (24 in.) wide, and 19 cm (7.5 in.) deep, and weighs approximately 22.7 kg (50 lb)

Note: The battery positive is typically connected to a ground window connected to the ground bus in the AC power service panel. This ground window serves as the –48 V return and LRE of the installed system.

Table 15 provides input, output, environmental, physical, and EMI specification for the NT5C03 rectifier.

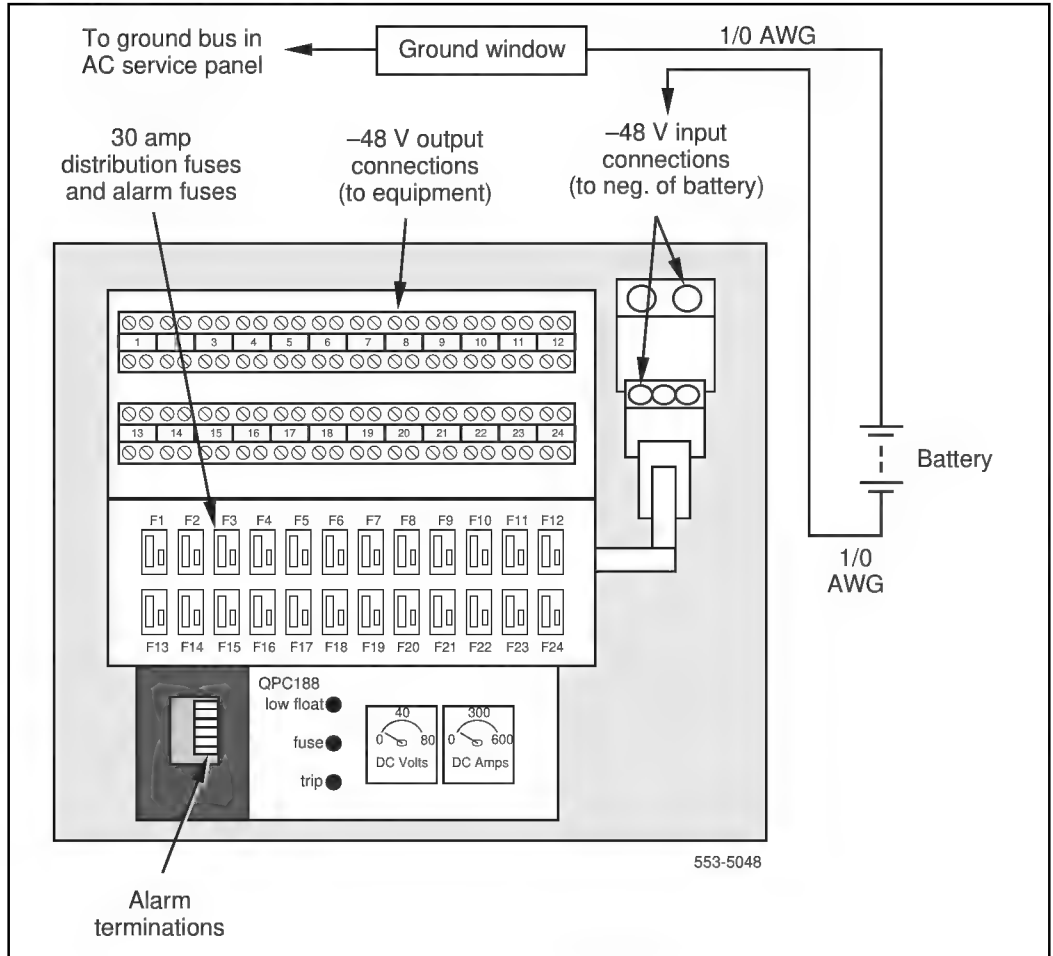
Table 15
NT5C03 rectifier specifications (Part 1 of 2)

Input voltage	183 to 264 V ac, 230 V nominal, single phase, 47–63 Hz	
Input current	23 A at 208 V 21 A at 230 V	
Output voltage	Nominal –52 V, maximum –56 V, adjustable from –47 to –56 V dc in float and equalize modes.	
Regulation	1%	
Input protection	30 A, 2-pole circuit breaker	
Output protection	Current protection:	60 A circuit breaker
	Thermal protection:	turnoff at 103°C, automatic restart <73°C)
	High voltage shutdown:	adjustable from –53 to –62 V
	Low voltage shutdown:	adjustable from –42 to –58 V
Alarm range	High voltage alarm:	adjustable from –48 to –61 V
Output noise and ripple	Less than 25 mV rms Less than 22 dBrnC Less than 200 mV peak-to-peak	
Efficiency	87% at a nominal voltage of 230 V at maximum load (30 to 50 A)	
Power factor	0.7 at nominal voltages and maximum load	
Electromagnetic Interference (EMI)	Meets FCC requirements for conducted and radiated EMI as specified in Docket No. 20780 (April 9/80) for Class “A” equipment	
Physical characteristics	Height:	22.9 cm (9 in.)
	Width:	48.3 cm (19 in.)
	Depth:	38.1 cm (15 in.)
	Weight:	38.5 kg (85 lb)

Table 15
NT5C03 rectifier specifications (Part 2 of 2)

Operating conditions	Temperature:	0 to 50°C (32 to 122°F)
	Humidity:	15 to 80% RH
	Altitude:	Sea level to 2100 m (7000 ft)
Transport conditions	Temperature:	–50 to 71°C (–58 to 160°F)
	Humidity:	Up to 100% RH at 25 mm of water vapor pressure
	Vibration:	5.5 to 500 Hz, 3.5 g maximum (sinusoidal); 762 mm (30in.) maximum drop (packaged)
	Pressure:	87.5 mm Hg at 15,200 m (50,000 ft)
	Temperature shock:	–50 to 27°C (–58 to 80°F) in 5 minutes
Storage	Temperature:	–40 to 60°C (–40 to 140°F)
	Humidity:	Up to 100% RH at 25 mm of water vapor pressure

Figure 18
QBL12 Power Distribution Box



NT6D82 Power System

The NT6D82 Power System is a positive ground, -48 V dc, 900 A power plant. It can be used with all Meridian 1 DC-powered systems, but it is optimized for larger system configurations such as system options 71, 81, and 81C. Other switchroom equipment that requires -48 V dc power may also be powered from the NT6D82 Power System, as long as there are sufficient output circuit breakers or auxiliary fuses, and a consistent, single-point ground topology is maintained for all associated equipment. For new installation, System 600/48 Power Plant should be used instead of NT6D82.

Figure 19 shows the NT6D82 Power System, which consists of an enclosed, front-access power distribution and control panel, mounted on a standard 23-in. relay rack, with wiring and provision for up to three RL100F50 rectifiers per rack. These rectifiers provide 100 A each for a total of 300 A in a single rack and up to 900 A total in a maximum configuration of three fully equipped racks.

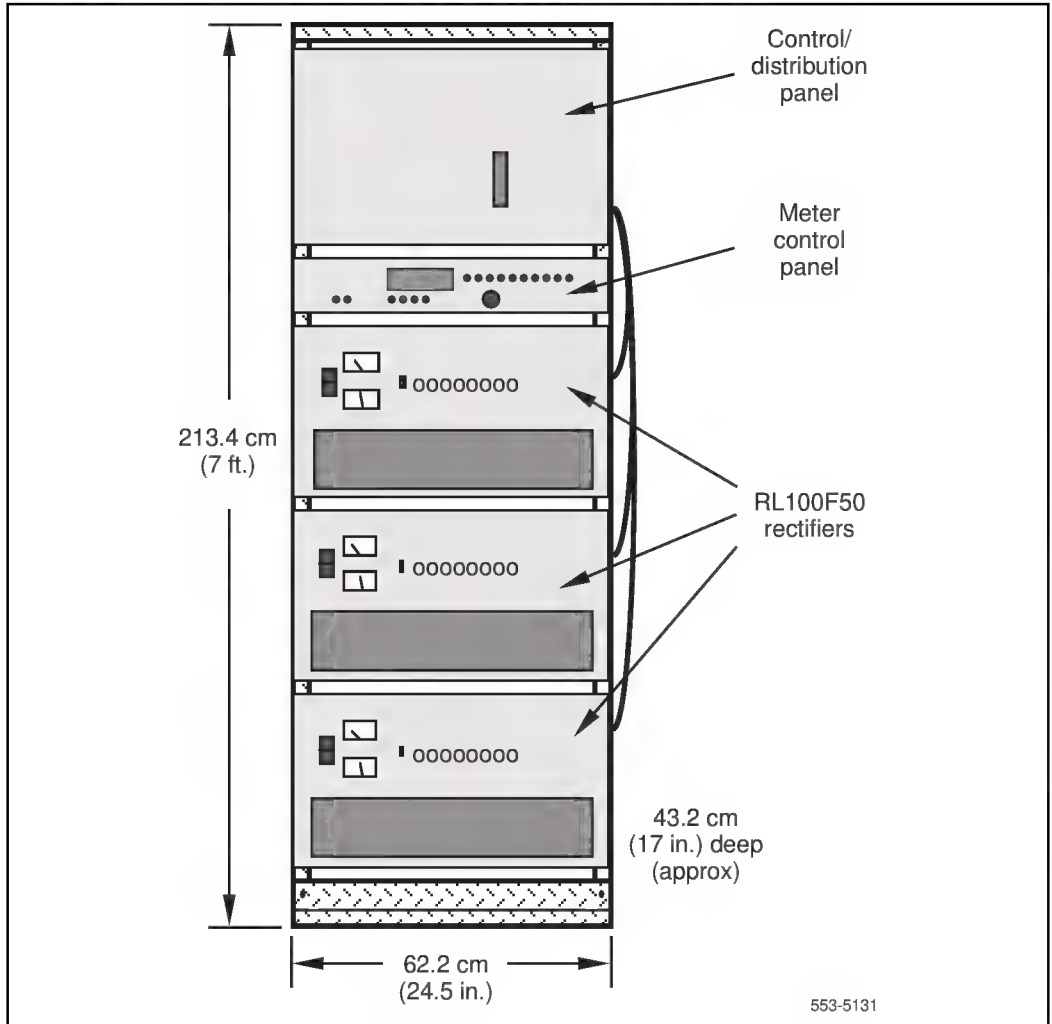
The NT6D82 Power System is organized into power bays. The main power bay contains both the control and distribution circuitry; the supplemental bay contains only the distribution elements and operates somewhat as a “slave” to the main bay. Each system has one main power bay and may have up to two supplemental power bays.

Two kinds of power bays are available: standard power bays, which use conventional power equipment racks; and seismic power bays, which use specially designed racks that have been strengthened for earthquake bracing.

The rectifiers operate on single-phase 60 Hz AC service, and may be strapped for 120, 208, or 240 V nominal input. The NT6D82 Power System may operate with or without a battery bank for reserve power capabilities. If a battery bank is connected, the rectifiers can operate in either float or equalize mode.

The system has a variety of monitoring and alarm features, such as high and low voltage alarms, fuse and breaker alarms, rectifier failure alarms, and low voltage disconnect. An interface to the NT8D22 System Monitor provides a subset of these alarms.

Figure 19
NT6D82 power bay configuration with three RL100F50 rectifiers



A single-pole, 125 A circuit breaker is connected in series with the rectifier negative output lead for short-circuit protection.

Specifications

The NT6D82 Power System operates within the specifications provided in [Table 16](#).

Table 16
NT6D82 Power System specifications (Part 1 of 2)

Input voltage	Nominal 120/208/240 V (strapping option), single phase, 57–63 Hz. Voltage ranges are 106 to 127 V, 184 to 220 V, and 212 to 254 V
Input current	37.8 A maximum at 208 V 32.7 A maximum at 240 V
AC input current	At 208 or 240 V, use 45 A (minimum) hard-wired circuit. High in-rush circuit breakers or slow-blow fuses are recommended.
Output float voltage	The float voltage is adjustable over the range of –48 to –58 V for floating a 23- or 24-cell battery. The float voltage range per cell is 2.15 to 2.25 V. Factory set value is –54.00 V.
Output equalize voltage	The equalize voltage is adjustable over the range of –50 to –58 V for equalizing the charge on a 23- or 24-cell battery. The equalize voltage range per cell is 2.20 to 2.35 V. Factory set value is –55.50 V.
Output current, max	900 A, full configuration, full load
Input protection	A two-pole circuit breaker opens both AC input lines for 208/240 V service or one side for 120 V operation.
DC current output protection	A limiting circuit is provided for each rectifier output for protection against damage from overloads. This circuit is factory set to limit output current to 110% of full load.

Table 16
NT6D82 Power System specifications (Part 2 of 2)

Storage temperature range	–40 to 85°C (–40 to 185°F)
Humidity	0 to 95%, non-condensing
Altitude	The maximum ambient operating temperature should be derated linearly from 50°C at sea level to 40°C at an elevation of 3050 m (10,000 ft).
Dimensions: (all bays)	Height: 213 cm (84 in.) Width: 62 cm (24.5 in.) Depth: 43 cm (17 in.) With diode panel, depth increases to 65 cm (25.5 in.).
Weight	Main or supplemental bay with three rectifiers: 544 kg (1200 lb) Single rectifier: 133 kg (292 lb) Diode panel: 9 kg (20 lb)
Heat dissipation	With 208 V ac input and 52.08 V dc output at full load, the heat dissipation of each rectifier is 580 watts (1980 BTU/hour).
Reliability	MTBF for the rectifier is 52,000 hours.

External DC power configurations

[Figures 20](#) through [26](#) show examples of DC-powered system power and ground connections. There are many variations of the rectifier and distribution equipment. The following information applies to [Figures 20](#) through [26](#).

If rectifiers are direct-wired to the local utility supply, conduit may be used. If conduit is used, it must contain an insulated ground wire (green) #6 AWG or larger.

Conduit is not necessary with the NT7D67CB PDU. However, 1.25 in. or 0.75 in. conduit may be used if local codes or individual installations require it. For overhead conduit installation, a conduit clamp may be used. For a raised-floor installation, the conduit should terminate at the floor. If the NT7D0902 Conduit Kit is used, conduit can enter from the rear of the system (above the floor).

Grounding considerations

As with all high current systems, good grounding is essential for proper equipment function. Be sure to review the section titled “Grounding” on page 11.

In Northern Telecom external DC-powered systems the common ground (+) bus bar in the DC distribution panel serves as both the battery return and logic return equalizers (BRE and LRE). Use a #6 AWG conductor to connect this bus to the ACEG.

If cord-and-plug wiring is used to power the rectifiers, a separate safety ground must be provided. The safety ground must be an insulated wire #6 AWG or larger. [Figures 20](#) through [26](#) show an isolated ACEG as the single-point ground. Depending on the distance between columns (and cabinets in upgraded systems) and the service panel, the Meridian 1 safety ground wiring may be daisy-chained or run independently from each column (or each row) to the ACEG. [Figures 20](#) through [26](#) show safety ground wiring in daisy-chain configurations.

Figure 20
DC power—multiple-column distribution with MFA150 Modular Power System

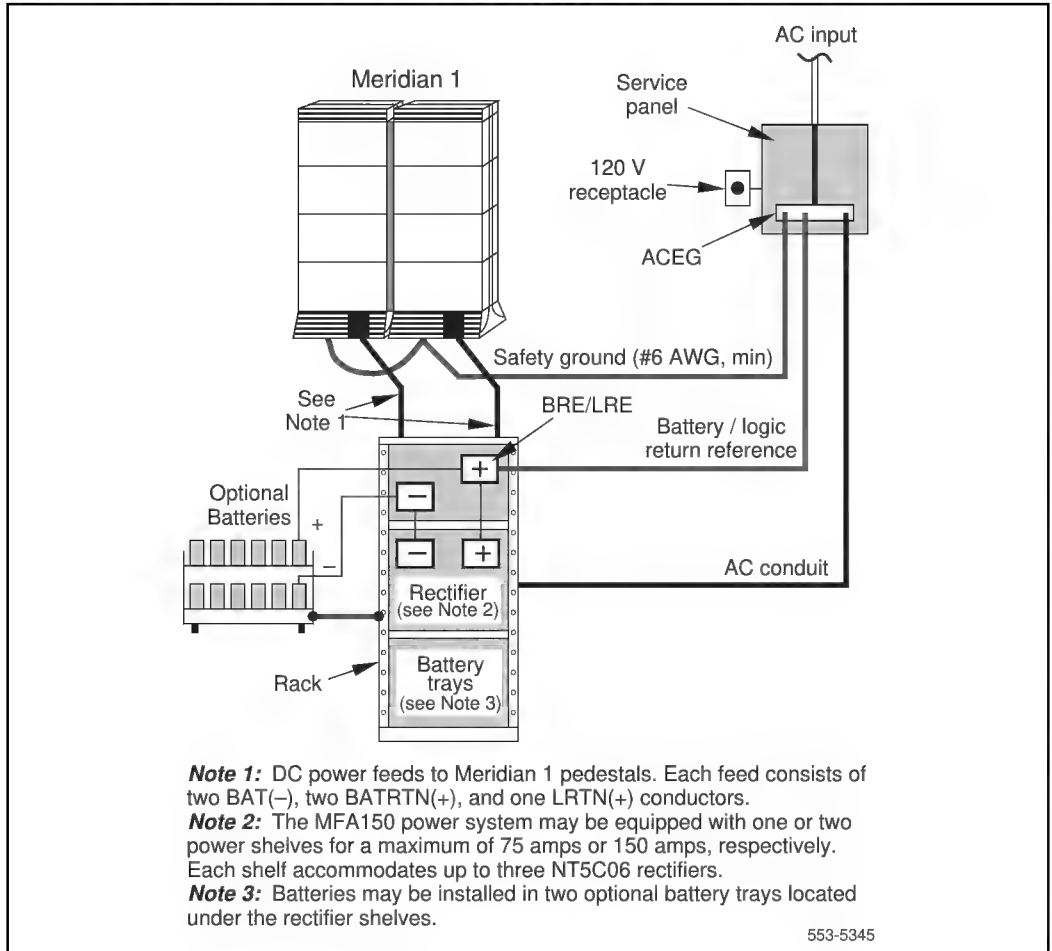


Figure 21
DC power—multiple-column distribution with System 600/48 Power Plant

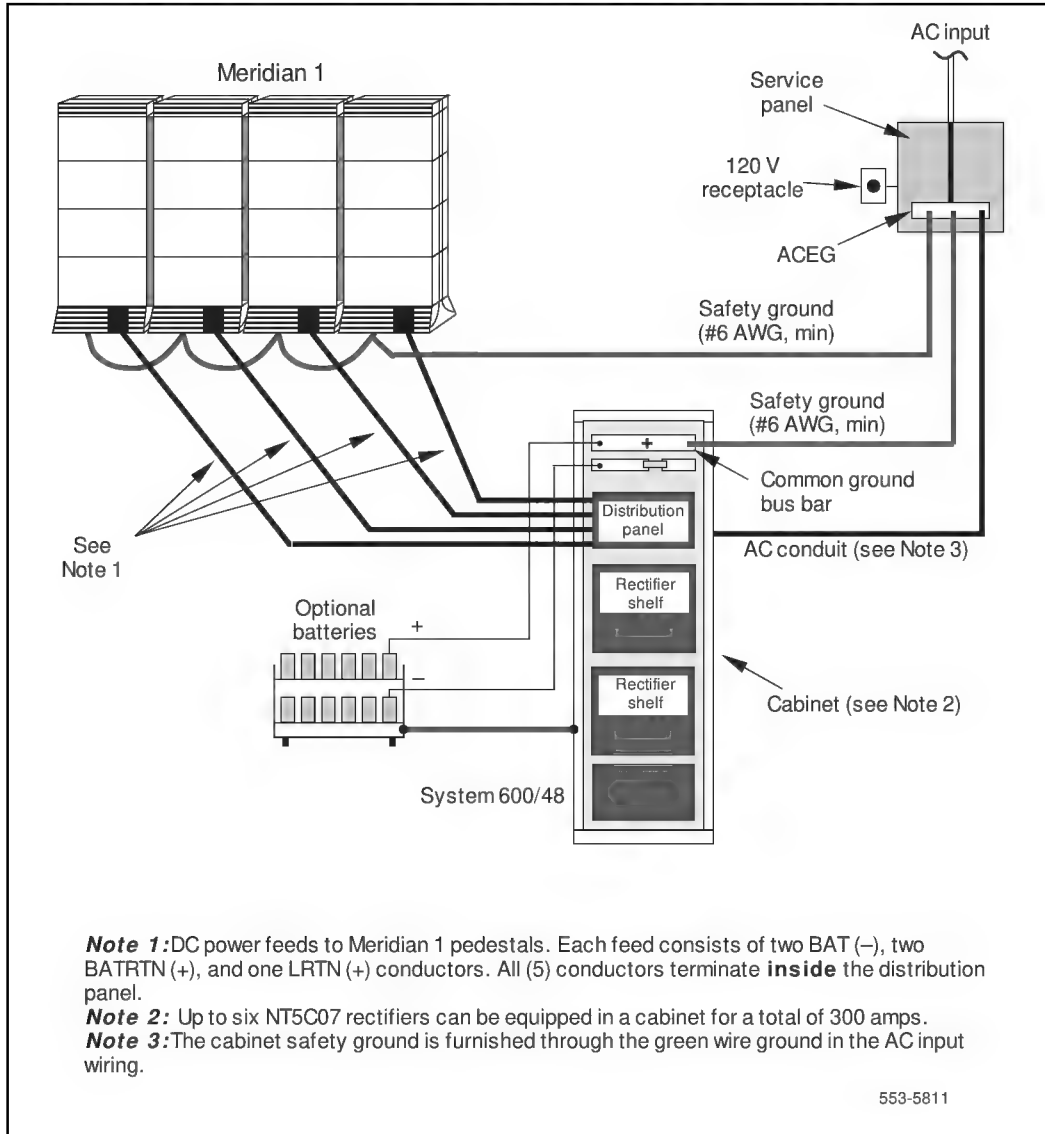


Figure 22
DC power—multiple-column distribution with NT6D82 Power System

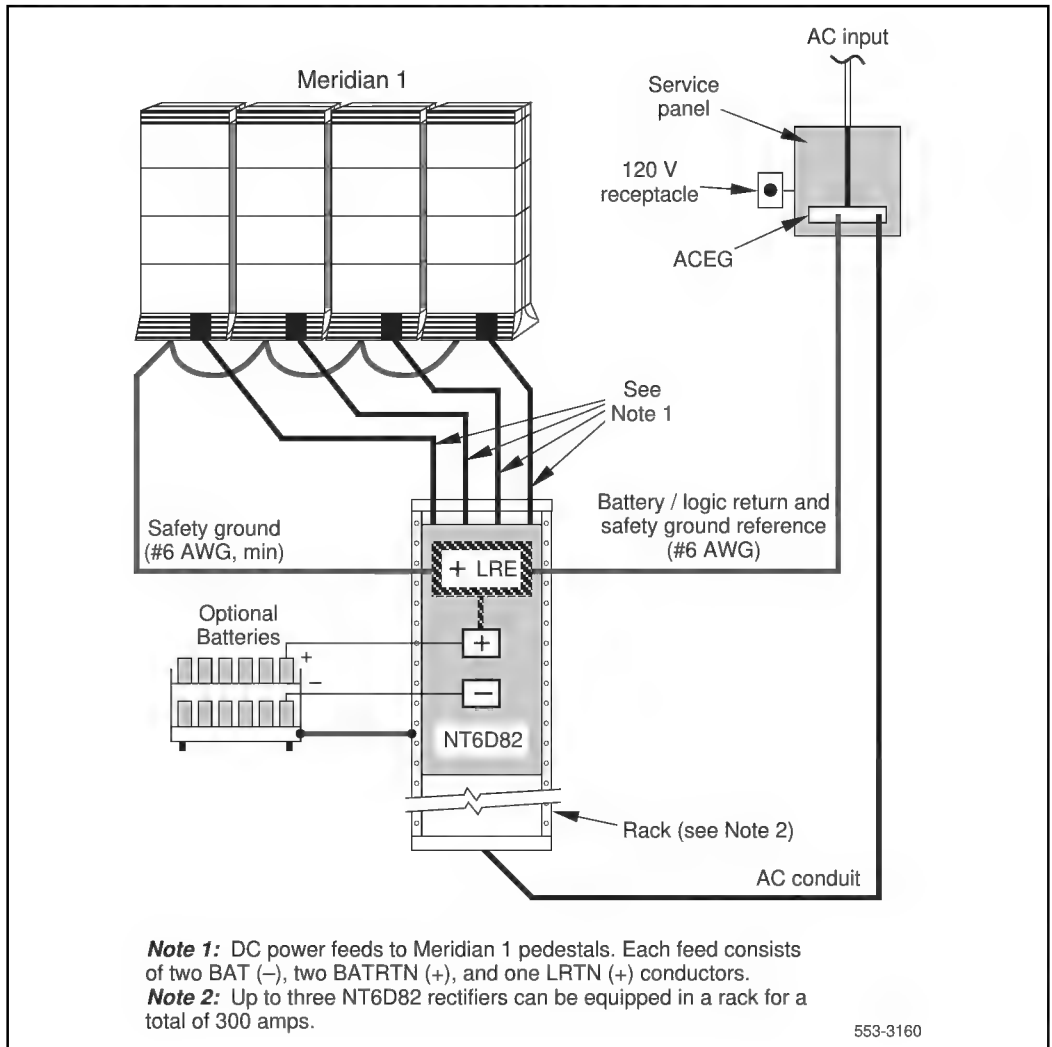


Figure 23
DC power—multiple-column distribution with QBL12 and customer power

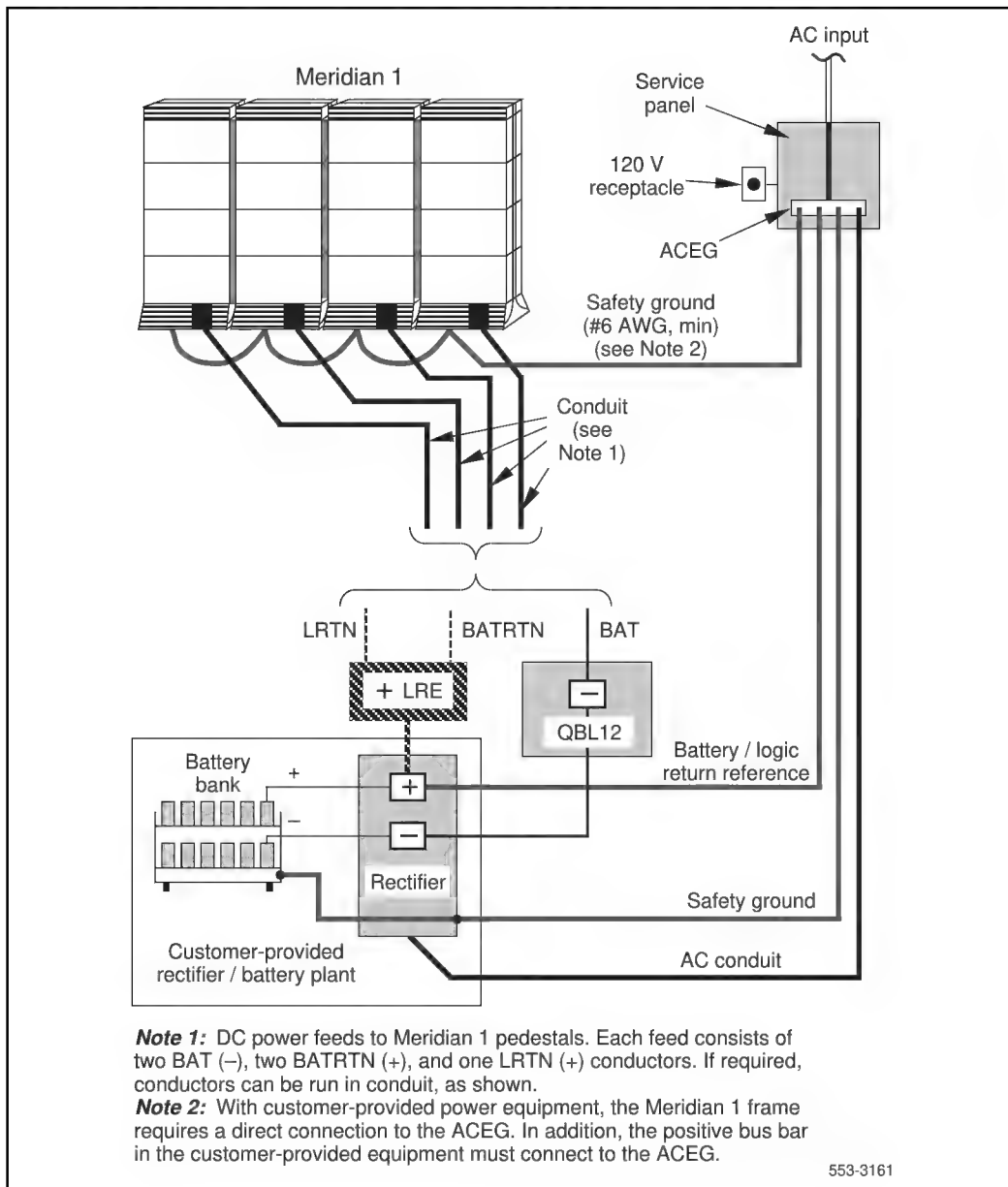


Figure 24
DC power—multiple-column distribution with NT0R72 rectifier and
QBL15 Power Distribution Box

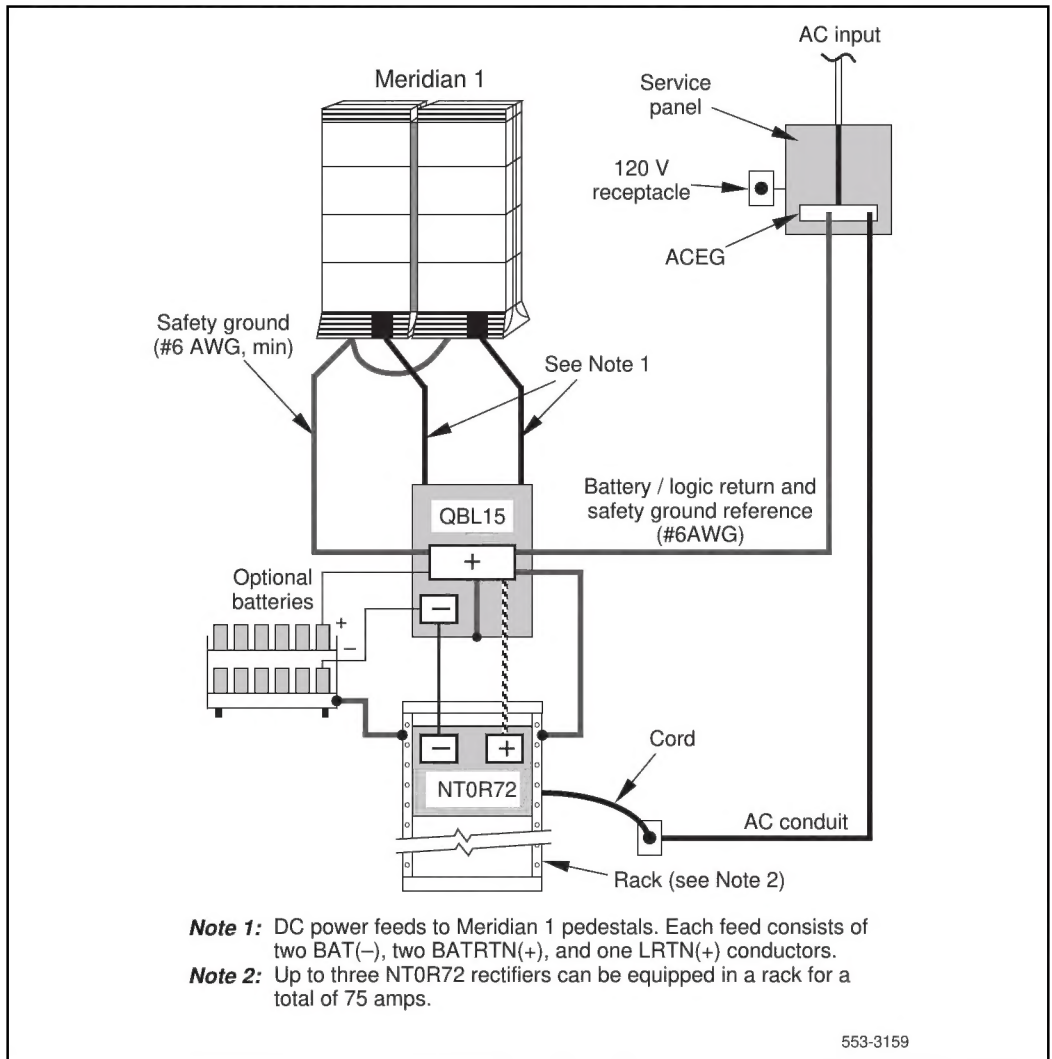


Figure 25
DC power—multiple-column distribution with J2412 Power Plant

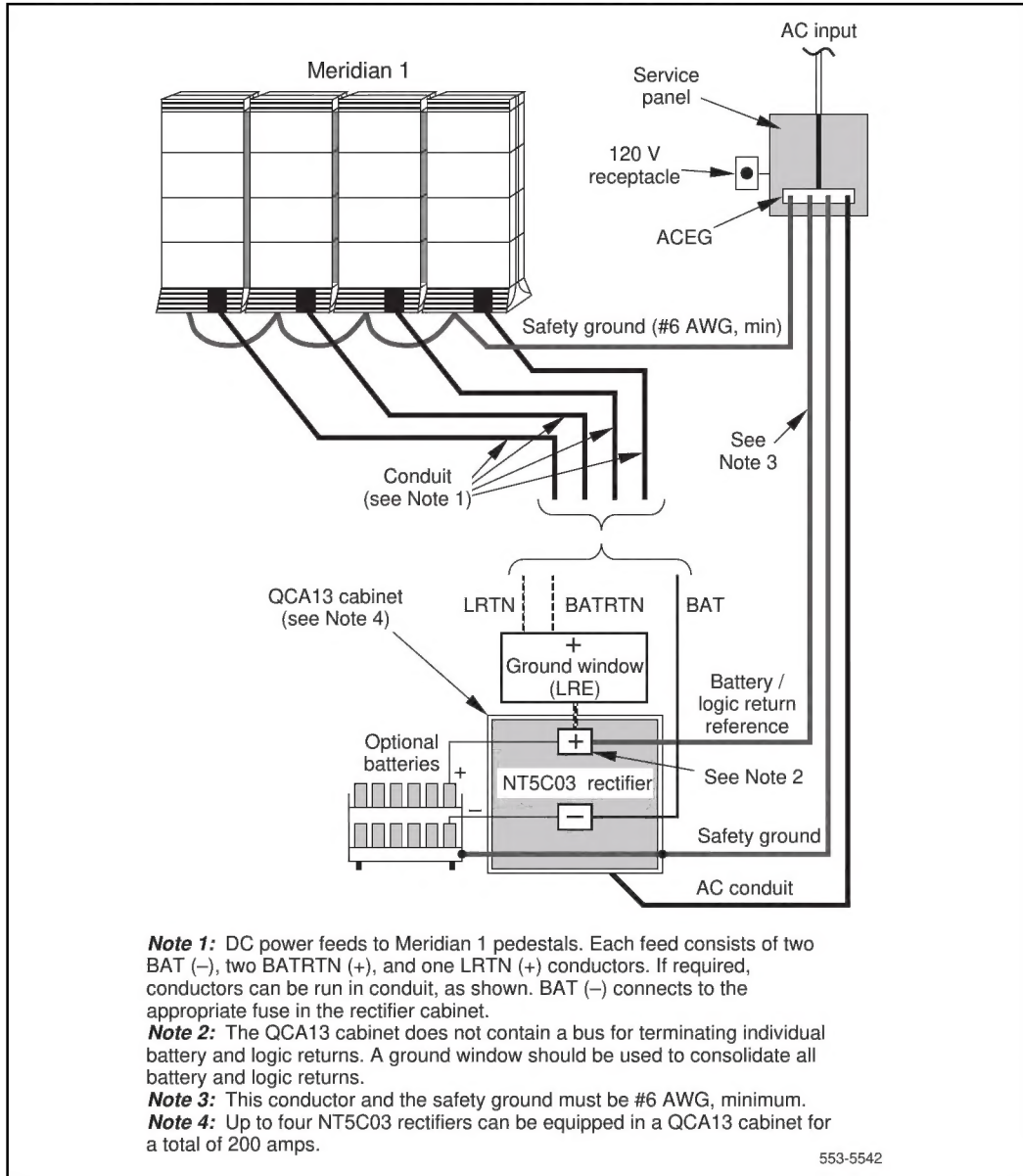


Figure 26
DC power—example of upgraded system distribution

